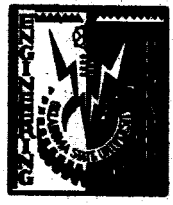

OFFICE OF ENGINEERING RESEARCH

OKLAHOMA STATE UNIVERSITY

A PROGRAM FOR SELECTING, EDITING AND DISSEMINATING ENGINEERING AND SCIENTIFIC SUBJECT MATTER FROM NASA TECHNICAL REPORTS

QUARTERLY REPORT

TO

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

REPORT NO. ER 68-I-2

DATE February 29, 1968

A PILOT PROGRAM FOR SELECTING, EDITING, AND DISSEMINATING ENGINEERING AND SCIENTIFIC EDUCATIONAL SUBJECT MATTER FROM NASA TECHNICAL REPORTS

QUARTERLY REPORT
December 1, 1967 through February 29, 1968

COLLEGE OF ENGINEERING
OKLAHOMA STATE UNIVERSITY
STILLWATER, OKLAHOMA

Administered under Contract Number NSR 37-002-045
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QUARTERLY REPORT

A. Monographs

Fourteen Monographs are ready for immediate distribution to educators and industry. Two other Monographs have been completed and are being typed for reproduction. Another Monograph is in the final stage of preparation, requiring further development by the authors.

Thirteen Monographs are in various stages of research and preliminary preparation. They cover material in the following subject areas: six in Heat Transfer, three in Thermodynamics and four in Control Systems. A total of thirty Monographs will be completed by August 31, 1968.

A total of 657 instructor copies and 3,099 student copies have been distributed. The distribution by Monograph is shown in Appendix I-1. Twenty-three evaluations have been returned by professors who have used the material in the classroom and industrial people who have reviewed them. Comments made on the evaluation sheets are included in Appendices II-2 and II-3.

The increased number of requests for information about the program is attributed to increased promotion. Details on the promotion will be covered in the dissemination section of the report.

B. Visual Briefs

Twenty-one Visual Briefs are ready for distribution to universities and industrial organizations. A total of 194 requests for Visual Briefs have been received. Eleven requests for the films are unfilled. Visual Brief dissemination by Visual Brief number is shown in Appendix II-1.

Normally requests for Visual Briefs have been filled promptly. However, all copies of several of the films are presently out for loan and some requests remain unfilled. This situation can be attributed to the increased promotion of the program during this quarter. Follow-on letters are being mailed to the individuals who have had the films for undue periods of time. They are politely requested to return the film promptly after using it. The unfilled requests will be filled promptly as copies of the Visual Briefs become available.

Fifty evaluations have been returned by individuals using the Visual Briefs. Comments on the evaluation sheets are shown in Appendices II-2 and II-3.

C. Dissemination

An increased number of requests for information regarding Monographs and Visual Briefs were received during the quarter. A total of 167 professors in 77 universities have requested Monographs for use in their classrooms or for their review (See Appendix IV). This increased activity can be attributed to two promotional programs.

1. Advertisement

A full page advertisement describing Monographs and Visual Briefs was placed in the January, 1968 issue of the Journal for Engineering Education to create the interest of educators and industrial training supervisors in the NASA Pilot Program. A reprint of the advertisement is shown as Appendix III.

The Journal of Engineering Education was selected because it is the official magazine of the American Society for Engineering Education. The Journal reaches administrators and teachers of engineering and engineering technology as well as industrial and government leaders concerned with engineering education. The Journal has readers in all 50 states and in over 70 foreign countries.

The advertisement was strategically placed on fifth page of the the magazine. It was located immediately following the popular monthly article "do you know...?" The advertisement was four pages ahead of the feature article of the month, "FINAL REPORT: GOALS OF ENGINEERING EDUCATION."

Dr. McCollom received his copy of the January issue on February 12, 1968. Response to the advertisement was quick as requests for information regarding the program were received on February 14, 1968. The requests have been arriving at a steady rate and a total of 47 have been received to date. In most cases the coupons on the advertisement have been completed and mailed.

Each individual requesting information have been promptly answered. A letter describing the program, its purpose and how material can be ordered have been mailed along with abstracts of Monographs and Visual Briefs available.

2. Letters to Deans

In November and December, 1967, letters describing the Monographs and Visual Briefs and their merits of using the educational material were mailed to 189 Deans of Engineering (See Appendix V). The American Society for Engineering Education was the source of the names and addresses. One hundred twenty professors in 51 universities have requested Monographs and Visual Brief material as result of these letters. Eighty-seven have requested Monograph material; 14 have asked for Visual Briefs; and 19 requested both. Requests resulting from the letters to the Dean's are still being received.

3. Industrial Survey

A form letter describing Educational Monographs and their potential use as a continuing education tool have been mailed to 205 industrial organizations that maintain an industrial membership in the American Society for

Engineering Education. A copy of the letter is shown in Appendix VI. Abstracts of Monographs presently available were enclosed with the letter along with a copy of a Monograph in each of the three subject areas. Appendix VII lists the industrial organizations selected and the specific representatives contacted.

Continued effort will be made to evaluate industry's interest in this type of educational tool for the practicing engineers.

A follow-on program for the Education Brief Survey conducted by the Goddard Space Flight Center has been implemented to further evaluate the impact of the Educational Monograph as a continuing education tool for practicing engineers. Individually prepared letters are being mailed to industrial organizations that made secondary responses to the Goddard Space Flight Center Survey. Six of the follow-on letters have been mailed and the remaining ten companies will be contacted in the near future. A typical letter mailed to these organizations is shown in Appendix VIII. A general letter describing the Monograph program will be mailed to the industrial organizations that made an initial (but not secondary) response to the Goddard Space Flight Center Survey. It is hoped that the follow-on letter may stimulate participation by these firms since additional Monographs are available for their use.

As a future follow-on, a questionnaire will be developed and mailed to all organizations that respond to our initial efforts. The step is planned in approximately two months to give the firms ample time to respond.

4. Book Publishers

In December and January the following book publishers were contacted to determine if they would be interested in marketing Monographs: John Wiley and Sons, Inc., New York; McGraw-Hill Book Company, Inc., New York; D. Van Nostrand Company, Inc., Princeton, New Jersey and John McCutchan Corporation, San Francisco, California.

John Wiley and Sons, Inc. and McGraw-Hill Book Company indicated an interest in the concept but were not optimistic in the acceptance of paper backs in engineering education. Both organizations were receptive to further discussions.

D. Van Nostrand Company, Inc. questioned the economics of preparing and marketing paperbacks. However, they were interested and requested that 20 copies of all Monographs and 100 copies of the abstracts be provided to them for a market survey. They recently reported that the limited number of responses to date in their survey did not indicate a definite positive or negative acceptance of Monographs as an educational tool.

John McCutchan Corporation is a book company that deals primarily in small groupings of published material. Mr. John McCutchan discussed the program in detail and concluded that the marketing of Monographs could not support the program. He said Monographs were particularly feasible for library or reference purposes, which is a limited market.

In summary, it is concluded from the discussion with book publishers that the marketing of Monographs would only partially support a continued program of creating Educational Monographs. Indications are that a greater selection of Monographs in each subject area would be necessary to assure frequent use by engineering educators.

D. Evaluation

Only a small number of evaluation forms have been received for both Monographs and Visual Briefs. Appendix I-2 and I-3 show the response on Monograph evaluation; and Appendix II-2 and II-3 show the response on Visual Brief evaluation sheets.

Ten of the 23 Monograph evaluation sheets that have been received were returned during January and February, 1968. Most of the evaluators requested the Monographs prior to the start of the semester.

Visual Brief evaluators continued to return a greater number of evaluation sheets (50) than the individuals using the Monographs (23). This can be attributed to the fact that Visual Brief requestors use the film when received since the film is on a loan basis. They then return the film, supplementary material and usually an evaluation sheet. The Monograph material is normally worked into a teaching program and may be used several months after receipt of material. In addition, the completion of an evaluation sheet apparently is set aside to be completed at a later date.

Now that a larger number of Monographs and Visual Briefs have been distributed, greater emphasis will be made during the third quarter in the follow-on program to encourage requestors of Monographs and Visual Brief material to complete the evaluation forms where Monographs were used during the semester just completed. Letters similar to those shown in Appendix V and VI of the Quarterly Report dated November 30, 1967 will be mailed to those requestors that have had ample time to use and evaluate the material.

Two evaluators have made comments about the educational Monographs that need to receive special documentation. They are:

> "It is my feeling that the Monograph series is very beneficial in that it permits the inclusion of timely material in lecture and laboratory courses for both graduates and undergraduates. The class texts and the teacher's notes are greatly enhanced by the availability of this material for use in outside projects or lectures. The most important aspect of the monograph is that someone is making a systematic search in each of the areas covered and presenting the material to engineering teachers for their use." (Auburn University)

> "Provided sufficient numbers of Monographs are available, the instructor can be selective to the extent that he presents topics which complement his course outline. New materials of this form should confront students with a segment of the current literature... which should be helpful in stimulating research ideas." (University of Virginia)

These two comments describe the present status of the educational Monograph--(1) the Monographs are being accepted as an educational tool and (2) a greater selection of Monographs in each subject area are needed to encourage frequent use in engineering education.

E. Program Support

Continued effort has been made to receive financial support for the continuation and expansion of A Center for Creating Educational Monographs in Technology. In December, 1967, Drs. McCollom and Dunn visited with representatives of the Office of State Technical Services, National Science Foundation, Army Research Office, United States Office of Education and National Aeronautics and Space Administration to discuss the continuation of the Educational Monograph program. As a result of these conferences, a preliminary proposal for the continuation and expansion of A Center for Creating Educational Monograph in Technology has been prepared.

A five year plan has been developed by the Center Administrative personnel to evaluate more specifically the impact of this educational tool on the continuing education of engineers and scientists. The five year plan would allow sufficient time to (1) prepare a greater number of Monographs to evaluate the acceptance of Monographs by educators and industry, (2) develop refined procedures for the preparation of Monographs in larger quantities, thereby reducing the unit cost of individual documents, and (3) investigate and develop permanent means of financing the publications of the Monographs.

During the first two years of operation of the present pilot program, a total of 30 Monographs will have been completed. The five year proposal envisions an accelerated rate of preparation: 1st year, 20 Monographs; 2nd year, 40 Monographs; and 3rd and subsequent years, 60 Monographs per year. The modest increase of Monographs prepared in the first year provides time for organizing the Center in a new organizational structure.

Administrative, reproduction and marketing activities of the Center would be performed at Oklahoma State University under the direction of Dr. Kenneth A. McCollom. He would be assisted by a Deputy Director, Mr. Robert L. Overton, and a limited staff of technical and secretarial employees. Dr. Clark A. Dunn, Director Emeritus would be a consultant for the Center.

Subject area editors would be selected to assist in selecting material, obtaining authors and editing and approving Monographs after they are written. The subject area editors will be recent textbook authors or otherwise recognized as authorities in their respective fields. The nine proposed editors will be selected from a minimum of six universities located throughout the United States.

Monograph authors will be selected from various universities. They will be selected on the basis of their teaching experience in the subject area and the proposed material to be covered in the Monograph. A negotiated amount will be paid for each Monograph in an effort to control the cost of each document. Several modes of operation will be developed.

The preliminary proposal will be presented to the National Aeronautics and Space Administration, National Science Foundation, United States Office of Education and the Office of State Technical Services during the first week in March.

Preliminary contact has been made with the Oklahoma Office of the Office of State Technical Services in January, 1968. The basic concept of the educational Monograph program was favorably received. The local director could see the possibilities of the material being of value to the small to medium industrial

organizations they assist. A field representative of the local office presently has copies of the Monographs which he is using to determine their reception. Further meetings will be scheduled with the Oklahoma Office after they have completed their survey.

APPENDICES

APPENDIX I-1

MONOGRAPH DISSEMINATION STATISTICS
THROUGH FEBRUARY 29, 1968

Dissemination Summary by Monograph Number

Monograph Number	Instructor's Copies Sent	Student's Copies Sent	Unfilled Requests		Evaluations Received
			Instructor's	Student's	
CS-1	42	136	3	0	0
CS-2	0	0	60	288	0
CS-3	10	0	49	254	0
CS-4	0	0	66	310	0
CS-5	70	263	5	15	1
CS-6	75	332	4	0	0
HT-1	79	364	2	0	7
HT-2	48	169	3	0	1
HT-3	74	445	2	0	6
HT-4	66	409	2	0	6
HT-5	13	25	32	159	0
HT-6	0	0	58	191	0
HT-7	31	88	2	0	0
HT-8	20	161	6	0	0
TD-1	49	293	2	0	1
TD-3	55	304	3	0	2
TD-4	25	110	2	0	0
Totals	657	3,099	301	1,217	23

APPENDIX I-2

Totaled Responses on a Monograph Evaluation Sheet

Comments on Monograph from Classroom Use

1. The Monograph (was 10 , was not 2) used in a classroom situation.

2. The Monograph (was 10 , was not 1) used in context with closely related material in the course presentation.

3. The Monograph (was 6 , was not 2) used for the course described in the "Instructor's Guide for Monographs."

4. The Monograph (was 9 , was not 1) found suitable for the course in which it was used.

5. The technical information presented in the Monograph was (new to me 3 , well known to me 7) and (new to my students 8 , well known to my students 0).

6. The technical information in the Monograph (did 10 , did not 2) contribute to further understanding of the course material by the students in this course.

7. The home problems in the Monograph (were 5 , were not 5) assigned to the students in the course.

8. The home problems in the Monograph were (useful 8 , too complex 0 , too simple 0 , unnecessary 0).

9. The amount of material for the Monograph was found to be suitable for presentation in (--) hours of classroom lecture.

10. The amount of material for this Monograph should be made (longer 2 , same 8 , shorter 1) to have maximum effectiveness in class.

11. The reference bibliography (was 7 , was not 3) used and (was 4 , was not 2) a necessary requirement to gain additional information on Monograph subject.

Recommendations on Monographs in General

1. Monographs of technical literature such as this could be of (great 4 , some 7 , little* 0) use to me in my course presentation.

2. Monographs should include (more 3 , less 0 , no change in 8) material over that given here.

3. The general reference bibliography (should 6 , should not 3) include information as to what is available in each reference.

4. The format of the Monograph is considered (good 9 , could be better 3 , poor 0 , completely incorrect 0) for use as an insertion in a course in engineering.

Totaled Responses On A Revised Monograph Evaluation Sheet

General Information on Monographs:

Was the technical information covered in the Monograph of value in course presentation: --Good 9 / Some ___ / Little ___

Should the Monographs include more information than was presented?----------More 3 / Same 6 / Less ___

Is the format of the Monographs appropriate for use in engineering courses?-Good 9 / Fair ___ / Poor ___ / Incorrect

Comments on Monograph from Classroom Use:

Was the Monograph used in a classroom situation?----------Yes 8 / No 1 (Ind)*

Was the Monograph used in context with closely related material in the course presentation?------Yes 8 / No ___

Did the technical information in the Monograph contribute to the further understanding of the course material by the students in the course?----Great 3 / Some 5 / Little ___ / None ___

Were the home problems in the Monographs too complex?----------Not Used 1 / Too Complex ___ / Useful 7 / Too Simple ___ / Unnecessary ___

How many hours of classroom lecture time should be allocated for presentation of this Monograph? 1 1/2 hours

Would you use the Monograph if you taught the course again?----------Yes 8 / No ___

*Note: The Lummus Co. answered none of the questions concerning the classroom since it was an industrial evaluation.

APPENDIX I-3

Comments on Monographs from Professor Evaluators

HT-1: Calculation of Radiant Heat Exchange by the Monte Carlo Method

1. I did not require the students to program and operate the technique (as a result this knowledge of it is somewhat superficial). I asked them for a flow chart of the program to be written. This might be sufficient for some, but not the majority. (University of Florida)

2. I received the Monograph too late in the school year for proper usage. I will use it next year. (University of Nebraska)

HT-3: Method of Estimating Ratio of Absorptance to Emittance

1. Material is elementary and I fail to see its technical value for radiant heat transfer. (University of Arizona)

2. One advantage of using monographs should be found in the manner in which basic heat transfer theory is related to current practical applications. Problems should be written which deal with current and future aerospace and outerspace hardware. The theory presented in the monograph should be better illustrated and applied, via the problems. Even though the problem, and its solution, would remain basically the same, student motivation would be grately increased if the problems were rewritten. In addition to relating the problems to specific hardware, a statement of difficulties and history which led to the problem (such as a practicing engineer might encounter) would stimulate the teaching and learning process. (United States Naval Academy)

HT-4: Formulas for Radiant Heat Transfer Between Non-gray Parallel Plates of Polished Refractory Materials

1. A paragraph of introduction is needed before the analysis section. It would aid the incentive and understanding of the students to introduce them to the problem with information such as why the research was necessary, how it was conducted, and how the results have been used in specific space applications. On the whole I feel that these monographs will serve a useful purpose. (United States Naval Academy)

CS-5: Controller Design for Nonlinear and Time-Varying Plants

1. Since the monograph arrived in the summer there has not been an opportunity to evaluate it in a classroom situation, but I do have some comments to make on it. I think the idea and general format of the Monograph is good. This particular Monograph presents an interesting and useful approach....I am interested in the Monograph series and would appreciate being put on the mailing list for all Monographs dealing with control systems. (University of Texas)

TD-3: Critical Flow of Real Gases Through Nozzles

1. We used the Monograph...at the end of our year's course in Thermodynamics for undergraduates. Only one hour was devoted to this and this is admittedly too little to give the Monograph full treatment. Also, clearly this material is more suitable for first year graduate students. My own opinion of this Monograph is that it is an excellent discussion of various ways to determine critical flow conditions. I think it is something graduate students should have abailable to them. It should probably be used for graduate study as a textbook supplement. For undergraduates, the Monograph proceeds too rapidly...Reiterating, I think this is a nice report but a little too sophisticated for seniors ....Thanks for the opportunity to use this program. I hope to have the provilege of using another one this coming fall. (University of Southern California)

Comments to Questions Asked on Revised Monograph Evaluation Sheet

(A) In your opinion, are Monographs a useful method of presenting new technical information in the classroom until the material can be included in a textbook? (B) What are the good points? (C) Any improvements needed?

HT-1

A. Yes

Good Points: Provided sufficient numbers of Monographs are available, the instructor can be selective to the extent that he presents topics which complement his course outline. New materials of this form should confront students with a segment of the current literature which should be helpful in stimulating research ideas. (University of Virginia)

A. Yes

B. It includes current information ready for distrubution to students. (Auburn University)

HT-2

A. Yes

B. It presents current material. (Auburn University)

C. No

HT-3

A. Yes

B. Students get acquainted with the real analysis of problems which are confronting engineers who are active now.

C. Have more Monographs so that the instructor can be more selective. (University of Virginia)

A. Yes

B. It includes current information ready for distrubution to students. (Auburn University)

HT-4

A. Yes

B. Students observe analysis of real problems like ones that one might experience.

C. Have more Monographs so the instructor can be selective. (University of Virginia)

A. The Monograph technique is useful in adding to lecture material to indicate the state of the art. It is especially useful in graduate course work where texts can form the basis for instruction but must be augmented with current outside material. (Auburn University)

TD-1

I think the idea of the Monographs are excellent as they bring the latest in technical developments to the attention of the students. As a practicing engineer, I think they are excellent. Also, I would appreciate receiving any other ones OSU publishes in the field of Chemical Engineering. (Lummus Company)

TD-3

A. Yes

C. Yes (Auburn University)

(A) Should a program of preparing Monographs be expanded to cover a wide variety of subject areas? (B) Would you use them frequently if you taught classes in the subject areas?

HT-1

A. Yes

B. I feel that such Monographs could help the course become more "current research problem" oriented, and this is good. I feel that about four Monographs (with homework problems) would be the most I could use in my radiation heat transfer course...unless there is a major modification of the outline. (University of Virginia)

A. Yes

B. Yes (Auburn University)

HT-2

A. Yes

B. Yes (Auburn University)

HT-3

A. Yes

B. Yes (University of Virginia)

A. Yes

B. Yes (Auburn University)

HT-4

A. Yes

B. Yes (University of Virginia)

A. I think so. The Monograph technique if used by the instructor is an excellent way of promulgating recent technical information.

B. Yes (Auburn University)

Additional Comments from University of Virginia - I think the Monograph idea is a very good one and commend your office for the work you are doing in instigating it. I think the extra effort required by the faculty in preparing for the lectures on the Monograph subjects is a good investment also.

TD-1

A. Yes

TD-3

A. Yes

B. Yes (Auburn University)

APPENDIX II-1

VISUAL BRIEF DISSEMINATION STATISTICS
THROUGH FEBRUARY 29, 1968

Dissemination Summary by Visual Brief Number

Visual Brief Number	Number Sent	Unfilled Requests	Evaluations Received
VB-1	7	0	3
VB-2	3	0	1
VB-4	13	1	4
VB-5	8	0	0
VB-8	13	3	1
VB-9	8	1	2
VB-10	10	1	3
VB-11	7	0	1
VB-12	12	1	3
VB-13	15	2	3
VB-15	8	1	2
VB-17	7	0	3
VB-19	12	0	4
VB-20	6	0	1
VB-21	8	0	1
VB-23	4	0	0
VB-24	11	0	5
VB-27	7	0	3
VB-28	5	0	1
VB-31	10	0	5
VB-33	9	0	4
Totals	183	11	50

APPENDIX II-2

Totaled Responses on a Visual Brief Evaluation Sheet

Comments on Visual Brief from Classroom Use

1. The Visual Brief (was 23, was not 10) used in a classroom lecture situation.

2. The Visual Brief (was 16, was not 17) used in context with closely related material in the course presentation.

3. The Visual Brief (was 27, was not 3) found suitable for the course in which it was used.

4. The Visual Brief (would 13, would not 9) have been as suitable for another course. If so, what course? _____

5. The technical information displayed in the Visual Brief (was new to me 12, new to my students 23, well known to me 13, well known to my students 1).

6. The information displayed in the Visual Brief (did 28, did not 2) contribute to further understanding of the course material by the students in the course.

7. The visual material (did 23, did not 4) present the effect well that was described in the accompanying documentary material.

8. The instructor (did 16, did not 13) read the documents accompanying the visual material prior to presentation in class.

9. Material observed in the Visual Brief of particular value other than that described in the documentary summary accompanying the brief is _____

_____

10. The subject matter (could 5 , could not 23) have been as easily presented to the students without the visual material.

11. Other types of visual aids (would 4 , would not 11) have been as effective as presenting the subject material. If so, what type? _____

12. The amount of material presented in the Visual Brief was (more 6 , alright 17, less 3) than necessary to adequately present the technical material there.

13. The Visual Brief required (little 17, some 14, much 0) additional information from the instructor to properly present the subject to the class.

14. It was of (little 3 , some 15, great 7) help to have the reference documents accompanying the Visual Brief for effective classroom presentation.

Recommendations on Visual Briefs in General

1. Visual Briefs on technical subjects such as this could be of (great 13, some 15, little 0) use to me in my course presentation.

2. Visual Briefs should include (more 4 , less 3 , no change in 15) material over that given here.

3. Visual Briefs would (probably 11, probably not 12) be more suitable for educational purposes outside of the classroom lecture.

4. Visual Briefs would be (more 5 , same 7 , less 7) useful if the report material had been prepared specifically for one classroom lecture.

5. I would use technical movies (more 7 , same 15, less 5) if amount of material shown in the film were reduced to bare technical essentials and let me do the talking.

6. The inconvenience of obtaining the projector arrangement for classroom lecture (does 2 , does not 24) significantly affect how often I use technical movies.

Totaled Responses On A Revised Visual Brief Evaluation Sheet

General Information on Visual Briefs:

Was the technical information covered in the Visual Brief of value in course presentation: ----Yes 2 / No

Should the Visual Brief include more information than was presented?-----More 1 / Same 1 / Less

Would the Visual Brief be more useful if the accompanying report material had been prepared specifically for a classroom lecture? ---------More 2 / Same / Less

Would the material shown on the film be more effective if edited and condensed? ---------Yes 1 / No 1

Does the inconvenience of obtaining a projector for a classroom lecture effect the frequent use of technical movies? --Yes / No 2

Comments on Use of Visual Briefs

In what situation was the Visual Brief used? _____

Did the instructor read the documents accompanying the Visual Briefs before the film was used? -----Yes 1 / No 1

Was the Visual Brief used in context with closely related material?------Yes 2 / No

Did the Visual Brief present the effect well and contribute to the further understanding of the participants? -------Well 1 / Fair 1 / Poor

Would the Visual Brief be more useful for educational purposes outside the classroom? ----------Yes 1 / No 1

Could the subject matter have been as easily presented without the visual matter? -------Yes / No 2

Would you use this Visual Brief again in an educational situation?-------Yes 2 / No

APPENDIX II-3

Comments on Visual Briefs From Professor Evaluators

VB-1: Smoke Trail Wind Shear Measurements

1. The music is annoying. (University of Florida)

VB-4: Bubble Dynamics for Nucleate Boiling in Reduced Gravity

1. No classroom use, but laboratory presentation has been helpful to students and stimulated discussion of related problems. (University of California at Los Angeles)

2. This brief is quite good. (Utah State University)

3. Too narrow in scope to be of much value to undergraduate students. Could provide quite useful for graduate students with special interest in research area. (Pennsylvania State University)

4. The film was somewhat repetitious. A summary was needed. Less repetition and a more concise presentation for this topic would be appropriate. The musical background was distracting.

VB-5: Polarized Light Photography to Resolve Fatigue, Cyclic, and Sustained Stress Crack Propagation Zones in Metals

1. This brief was reviewed by our Metallurgy Department and they feel it would be extremely useful for a graduate student undertaking research in this area. However, they foresee no room for this in any courses presently offered here. (Virginia Polytechnic Institute)

VB-8: Flight Measured Control Power and Damping Required for VTOL Aircraft

1. All Visual Briefs should have sound film. (University of Virginia)

2. The inclusion of root locus or other stability information would make this an excellent film for a course in control system stability and operation. Each new flight sequence should be preceded by a listing of the pertinent data for the flight sequence. It might also be advisable to precede this film with a brief summary of VTOL Aircraft. (Virginia Polytechnic Institute)

VB-9: Pool Heating of Liquid Hydrogen Over a Range of Accelerations

1. No classroom use, but laboratory presentation has been helpful to students and stimulated discussion of related problems. (University of California at Los Angeles)

2. Too narrow in scope to be of much value to undergraduate students. Could prove quite useful for graduate students with special interest in research area. (Pennsylvania State University)

VB-11: Transonic Buffeting of Hammerhead Launch Vehicles

1. To the untrained eye, the test film is just many shots of the same thing. (Implication is that there are insufficient differences except for very careful delineations). (Virginia Polytechnic Institute)

VB-12: Experimental Observations of Transient Boiling in Subcooled Water and Alcohol

1. More effective presentation of the subject material would have been accomplished with better film. After previewing it was decided the film was not what was needed and was not shown to the class. (Utah State University)

2. Too narrow in scope to be of much value to undergraduate students, Could prove quite useful for graduate students with special interest in research area. (Pennsylvania State University)

3. The quality of the photography was not the best. The initial library scenes added little. (United States Naval Academy)

VB-13: A Visual Study of Two Phase Flow in a Vertical Tube with Heat Addition

1. No classroom use, but laboratory presentation has been helpful to graduate students involved in research and stimulated discussion of related problems. (University of California at Los Angeles)

VB-15: A Visual Study of Velocity and Buoyancy Effects on Boiling Nitrogen

1. No classroom use, but laboratory presentation has been helpful to graduate students involved in research and stimulated discussion of related problems. (University of California at Los Angeles)

2. Too narrow in scope to be of much value to undergraduate students. Could prove quite useful for graduate students with special interest in research area. (Pennsylvania State University)

VB-17: Expansion Tube Hypersonic Test Facility

1. We used this on our TV net - slight flicker, indicating out of synchronization. (University of Florida)

VB-20: Magnetically Supported Superconducting Spherical Gyro

1. No classroom use, but laboratory presentation has been helpful to graduate students involved in research and stimulated discussion of related problems. (University of California at Los Angeles)

VB-21: The Supersonic Transport in the Air Traffic Control System

1. Prefer sound track with all briefs. (University of Virginia)

2. Visual Brief was also shown to Civil Air Patrol audience. (University of Virginia)

3. We feel that this film could have two possible uses: (1) in a freshman-level motivation-oriented course, and (2) in an analog simulation course as an introduction to a typical problem. Some NASA "sales pitch" and emphasis on highly placed NASA officials is objectionable. (Virginia Polytechnic Institute)

VB-24: Spacecraft Landing Dynamics

1. All Visual Briefs should have sound. (University of Virginia)

2. Received only VB-24A and not VB-24B so incomplete use. (ED. Note: This is when we discovered that VB-24 came to us incomplete) (University of Pittsburgh)

3. Too long for the rather specialized material presented. (University of Florida)

VB-27: Flammability of Surfaces in Zero Gravity

1. Showing of the same phenomena for different pressures, compositions, etc., is unnecessary. Added nothing to the basic phenomena being presented. (University of Pittsburgh)

VB-28: Journal Bearings in Laminar and Turbulent Regimes

1. The film is poor but the additional information is good. The students were not impressed with the film because of its poor quality. (Auburn University)

2. As to my review of the film, I am actually not particularly well qualified to judge it having only a minor interest in lubrication. Briefly, I felt that the photography was excellent but the subject was best suited for a graduate - level presentation. (Pennsylvania State University)

VB-31: Human Tolerance to Acceleration

1. This appears to be an excellent film for technical society meetings and other general science oriented meetings. It might also be used as

one lecture in a course in bio-medical electronics. The instrumentation is of interest and the film might be of use in an instrumentation course; however, it is felt that it would require extensive editing before being used in this manner. (Virginia Polytechnic Institute)

2. A technical film which should be shown to people familiar with the terminology of human behavior. Primary emphasis is on breathing and oxygen content of blood. Not a good film for general studies although it serves to make students more aware of problem.

3. Needed definition of some medical terms. Far too long for the message that EBO gives less trouble than EBI. (University of Florida)

VB-33: Saturn Radiation and Convection Base Heating

1. Sound track could have provided the general information together with more information about nature of the film, calculation, etc. Was used as introduction to space age need for radiation heat transfer. (University of Virginia)

2. Without reference documents the Visual Brief is of very little or no use. After previewing, it was decided not to use in class. (Utah State University)

3. Major limitation is lack of time by the students to dig into the (written) material. (University of Florida)

4. This Visual Brief would probably be more for educational purposes outside the classroom lecture. (Rutgers)

APPENDIX III

ENGINEERING INSTRUCTIONAL MATERIAL

- NEW APPLICATIONS OF KNOWN PRINCIPLES
- NEW METHODS OF SOLVING PROBLEMS

MONOGRAPHS AND VISUAL BRIEFS FURNISHED FREE TO ENGINEERING EDUCATORS

MONOGRAPHS AND VISUAL BRIEFS HAVE BEEN PREPARED FROM NASA RESEARCH TO EVALUATE THEIR EFFECTIVENESS IN PROVIDING ENGINEERING EDUCATORS WITH NEW ENGINEERING AND SCIENTIFIC MATERIAL PRIOR TO ITS INCLUSION IN TEXT BOOKS

MONOGRAPHS

Monographs are designed to provide supplementary material in graduate or advanced undergraduate heat transfer, thermodynamics, and control systems courses. They require from one to three hours lecture time without undue research by the instructor. Instructor and student copies are furnished free.

VISUAL BRIEFS

These technical films provide visual information not readily presented in written material. Subject areas are: Heat transfer, gas dynamics, machine design, reaction kinetics, aircraft structures, control systems, and bioelectronics. Visual Briefs are furnished on a no fee, loan basis.

FOR FULL DETAILS, WRITE OR SEND THIS COUPON TO:

Dr. Kenneth A. McCollom
NASA Pilot Program
College of Engineering
Oklahoma State University
Stillwater, Oklahoma 74074

Name .....
Department .....
School .....
Address .....
City ..... State .....

College of Engineering **Oklahoma State University**

APPENDIX IV

MONOGRAPH DISSEMINATION BY UNIVERSITY

For Review or Classroom Use by Professors

University	Professor
Arizona State University	H. H. Young
Auburn University	R. I. Vachon
California Institute of Technology	R. H. Sabersky
City College of the City University of New York	Robert A. Graff Latif M. Jiji
Colorado School of Mines	Frank Stermole
Cornell University	Victor H. Edwards
Dartmouth College	A. O. Converse
Harvey Mudd College	Taghi Mirsepassi
Iowa State University	Donald C. Scouten Bion L. Pierson
Kansas State University	P. L. Miller C. L. Hwans
Lehigh University	Luis Pujol Benjamin E. Nevis
Louisiana Polytechnic Institute	Buck F. Brown
Louisiana State University	Ralph W. Pike
Massachusetts Institute of Technology	Y. T. Li
Michigan State University	George Coalman Gerald Park
Michigan Technological Institute	S. Winnikow
Mississippi Research and Development Center	Kenneth Wagner

University	Professor
New York University	John R. Ragazzini
North Carolina State University	W. C. Peterson
North Dakota State University	Kam Wu Li Karl G. Maurer Lampert P. Vogel
Northwestern University	Professor Walker Professor Larson William E. Schmitendorf
Ohio University	R. S. Mayer
Ohio Northern University	Robert J. Glass
Oklahoma State University	Charles M. Bacon Paul A. McCollum John B. West Rao Yarlagadda K. C. Chao W. C. Edmister
Oregon State University	Carl G. Downing
Pennsylvania State University	J. L. L. Baker C. Birnie, Jr. D. A. Bowlus J. A. Brighton G. M. Faeth D. R. Olson F. W. Schmidt J. L. Shearer
Princeton University	James B. Anderson Ronald P. Andres Ernest F. Johnson Richard K. Toner John C. Whitwell
Purdue University	Paul E. Stanley
Rensselaer Polytechnic Institute	H. L. Sneck
Rose Polytechnic Institute	Thomas Hutchison
Rutgers, the State University	Robert H. Page
Saint Louis University	Benjamin H. Ulrich John A. George

University	Professor
Southern Methodist University	James L. Melsa Andrew S. Page J. C. Denton
State University of New York	Chi-Tsong Chen
Tennessee Technological University	Cecil O. Alford John P. Wallace
Tulane University	John R. O'Louglin Chester A. Peyronnin Harold H. Sogin Robert G. Watts
United States Air Force Academy	Myron D. Harnly
United States Naval Academy	James A. Adams
University of Alabama	C. H. T. Wilkins
University of Arizona	H. C. Perkins Harvey Christensen Donald M. McEligot N. D. Cox Lynn Weaver
University of Arkansas	William J. Buche Stanley E. Stephenson
University of California, Berkeley	H. A. Johnson L. S. Caretto R. Greif Y. Taitel C. Tien L. Farbar R. F. Sawyer E. D. Howe P. B. Stewart
University of Cincinnati	James F. Thorpe Widen Tabakoff Marvin English R. D. Zerkle
University of Denver	M. L. Moe
University of Detroit	Leon Kowalcyzk C. O. Smith

University	Professor
University of Santa Clara	Richard C. Dorf
University of Southern California	John M. Lenoir
University of Tennessee Space Institute	R. L. Young
University of Texas	R. A. Helfinstine J. J. McKetta B. E. Short H. A. Walls
University of Utah	Otto C. Davidson Wayne S. Brown Fabio R. Goldschmied Arlo F. Johnson Gary M. Sandquist
University of Virginia	J. Taylor Beard Herbert Goller James W. Moore Robert Smoak
University of Wisconsin	Charles G. Hill C. A. Coberly Howard L. Harrison David R. Poirer
Utah State University	R. M. Holdredge Jack Keller
Valparaiso University	Leslie M. Zoss
Vanderbilt University	John W. Williamson
Washington University	Albert W. Black J. C. Georgian William J. Murphy
West Virginia University	Barnett F. Dodge
Ecole Centrale des Arts and Manufactures, Paris, France	R. Kling
Ecole Polytechnique, Montreal, Quebec, Canada	Michel Rigaud
University of Calgary, Calgary, Alberta, Canada	J. E. Venart

University	Professor
University of Waterloo, Waterloo, Ontario Canada	George D. Fulford D. C. T. Pei
University of Windsor, Windsor, Ontario Canada	J. Gordon Parr

APPENDIX V

DEANS OF ENGINEERING CONTACTED

Use of Educational Monographs

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University of Alabama	W. E. Lear
University of Alaska	C. E. Behlke
University of Alberta	R. M. Hardy
Antioch College	D. J. Myatt
Arizona State University	L. P. Thompson
University of Arizona	H. S. Coleman
University of Arkansas	G. F. Branigan
Auburn University	F. H. Pumphrey
Bradley University	M. G. Abegg
University of Bridgeport	W. P. Berggren
Brigham Young University	A. J. Hill
Brown University	P. F. Maeder
Bucknell University	H. F. Eckberg
University of Calgary	H. A. R. de Paiva
California Institute of Technology	F. C. Lindvall
California State College at Long Beach	W. J. W. Arnell
California State College at Los Angeles	E. H. Kopp
University of California	G. J. Maslach

University	Dean
University of California	Chauncey Starr
Carnegie-Mellon University	W. W. Mullins
Case Western Reverse University	R. E. Bolz
Catholic University of America	D. E. Marlowe
University of Cincinnati	Cornelius Wandmacher
Citadel	W. E. Anderson
Clarkson College of Technology	J. B. Russell
Clemson University	L. G. Rich
Cleveland State University	B. H. Bush
Colorado School of Mines	T. H. Kuhn
Colorado State University	L. V. Baldwin
University of Colorado	M. S. Peters
Columbia University	J. R. Dunning
University of Connecticut	A. B. Bronwell
Cooper Union for the Advancement of Science and Art	A. T. Teller
Cornell University	Andrew Schultz, Jr.
Dartmouth College	Myron Tribus
University of Dayton	M. R. Graney
University of Delaware	E. W. Comings
University of Denver	D. A. Day
University of Detroit	L. N. Canjar
Drexel Institute of Technology	L. A. Brothers
Duke University	J. L. Meriam
Ecole Polytechnique	Julien Dubuc
Fairleigh Dickinson University	H. A. Rothbart
University of Florida	J. A. Nattress

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George Washington University	H. E. Smith
Georgia Institute of Technology	A. G. Hansen
University of Georgia	C. C. Murray
University of Guelph	C. G. E. Downing
Harvard University	Harvey Brooks
Harvey Mudd College	W. E. Wilson
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University of Houston	C. V. Kirkpatrick
Howard University	S. S. Davis
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University of Illinois	W. L. Everitt
Iowa State University	G. R. Town
University of Iowa	Hunter Rouse
John Hopkins University	R. H. Roy
Kansas State University	R. G. Nevins
University of Kansas	W. P. Smith
University of Kentucky	R. M. Drake, Jr.
Lafayette College	W. G. McLean
Lamar State College of Technology	L. B. Cherry
Lehigh University	J. J. Karakash
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Louisiana State University and Agricultural and Mechanical College	R. W. Richardson
University of Louisville	R. C. Ernst
Lowell Technological Institute	C. A. Harris

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Manhattan College	R. T. Weil, Jr.
University of Manitoba	J. Hoogstraten
Marquette University	J. E. Matar
University of Maryland	R. B. Beckmann
Massachusetts Institute of Technology	G. S. Brown
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University of Missouri	Adrian Pauw
University of Missouri at Rolla	J. Stewart Johnson
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University of Nevada	J. T. Anderson
Newark College of Engineering	L. Bryce Anderson
University of New Hampshire	J. B. Hraba
New Mexico State University	Frank Bromilow

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State University of New York at Buffalo	R. Karl Willenbrock
State University of New York at Stony Brook	T. F. Irvine, Jr.
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Pratt Institute	C. M. Thatcher
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Rensselaer Polytechnic Institute	A. A. Burr
University of Rhode Island	T. Stephen Crawford
Rice University	W. E. Gordon
University of Rochester	R. G. Loewy
Rose Polytechnic Institute	D. E. Criss
Royal Military College of Canada	J. W. Dolphin
Rutgers - The State University	E. C. Easton
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Texas Technological College	J. R. Bradford
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University of Wyoming	A. J. McGaw
Youngstown State University	M. J. Charignon

OKLAHOMA STATE UNIVERSITY · STILLWATER

College of Engineering, Office of the Dean 74074
Frontier 2-6211, Ext. 7551

February 27, 1968

Mr. G. D. Lobingier, Director
Graduate Education Department
Westinghouse Electric Corporation
Westinghouse Education Center
Ardmore Boulevard & Briton Road
Pittsburgh, Pennsylvania 15221

Dear Mr. Lobingier:

As an Industrial Member of the American Society of Engineering Education, you and your company have shown an interest in engineering education.

Oklahoma State University has a program of selecting, editing and disseminating engineering and scientific education subject matter. The program is supported by the National Aeronautics and Space Administration. The initial objective of the program was to develop supplementary text material for university classrooms. However, we believe the program will be of interest to your firm and the practicing engineers within the organization.

Monographs present the results of recent NASA research in an educational format suitable for presentation in a university classroom, industrial seminar or for individual study. Monographs are designed for one to three hours of instruction and are available in three subject areas: Control Systems, Thermodynamics and Heat Transfer. They may involve material such as: (1) application of some principle regularly taught, (2) a new method of solving a typical problem or (3) the demonstration of some new application of a known principle. Each Monograph is prepared by an experienced writer and teacher in the field.

Abstracts of Monographs are enclosed for your review and distribution to interested people in your organization. Monographs are furnished to individuals or organizations who will evaluate them as an educational tool. An evaluation sheet is provided with each Monograph. Your evaluation of the Monograph would be of considerable benefit to us in the future planning of the program. Three typical Monographs are enclosed. Additional Monographs can be obtained by sending me the following information: Monograph number, name and mailing address of the person(s) who will use it, number of copies, and approximate date desired for use.

We believe the use of Monographs has a great potential in the continuing education of practicing engineers.

Sincerely,

Robert L. Overton

Robert L. Overton
Deputy Administrator
NASA Pilot Program

RLO:ven

APPENDIX VII

INDUSTRIAL ORGANIZATIONS CONTACTED

Use of Educational Monographs

Organization	Representative
Aerojet-General Corporation	Dr. P. H. Brunstetter, Manager Organization & Personnel Development
Aerospace Corporation	L. D. Ely, Assistant Manager Office of Technical Relations
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Allis-Chalmers Manufacturing Company	John Gammell, Coordinator Professional Development
Aluminum Company of America	R. C. Becker, Manager Professional Employment
American Cast Iron Pipe Company	K. R. Daniel President
American Electric Power Service Corporation	Larry Dwon, Manager Engineering Manpower
American Machine & Foundry Company	Frank De Maria, Manager Laboratory
American Motors Corporation	G. N. Smith, Assistant to Vice President Automative Engineering and Research
American Oil Company	D. G. Schroeter, Manager Employee Relations
American Telephone and Telegraph Company	W. M. Regets, Engineering Manager Organization
Ametek, Inc., Hunter Spring Division	S. A. Roth, Manager Advertising

Organization	Representative
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ARO, Inc.	J. W. McCurdy Assistant Manager
Astrosystems International, Inc.	A. G. Thatcher Vice President
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Automatic Electric Company	J. G. Cobban, Manager Professional Employment
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B & K Instruments, Inc.	K. N. Fieldhouse Measurement Engineer
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Bell Telephone Laboratories, Incorporated	S. B. Ingram, Director Employment
Bellcomm, Incorporated	N. W. Smusyn, Director Personnel
Bendix Corporation	J. M. LaRue, Director University and Scientific Relations
Bethlehem Steel Corporation	B. C. Boylston, Manager Personnel
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Boeing Company	T. J. Johnston, Chief College Relations
Bolt Beranek and Newman, Inc.	Dr. Ira Dyer, Director Program for Advanced Study

Organization	Representative
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Carrier Corporation	C. J. Potter, Director Personnel Development
Caterpillar Tractor Company	W. R. Watson, Manager Personnel Development
Central Hudson Gas & Electric Corporation	C. A. Bolz, Assistant Vice President
Central Illinois Public Service Company	J. R. Broderick, Vice President Operations
Champion Spark Plug Company	R. K. Christie
The Chesapeake & Potomac Telephone Companies	C. K. Stott, Assistant Vice President
Chrysler Corporation-Engineering Staff, Chrysler Institute of Engineering	L. R. Baker Director
Cities Service Oil Company	F. T. Diacon, Supervisor Graduate Employment and Training
Cleveland Electric Illuminating Company	H. L. Williams, Vice President Engineering
Collins Radio Company	E. D. Stambaugh
Combustion Engineering, Inc.	E. A. Ferris, Administrator Training
Consolidated Edison Company of New York, Inc.	K. F. Bellows, Assistant Vice President
Consumers Power Company	F. C. Fisher Vice President
Continental Can Company, Inc.	C. H. Olmstead, Director Manufacturing Training and Development
Corning Glass Works	A. W. Weber Vice President
Cummins Engine Company, Inc.	V. L. Beals, Vice President & General Manager, Research & Engineering
Cutler-Hammer, Inc.	T. B. Jochem, Supervisor Technical Personnel

Organization	Representative
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Detroit Edison Company	Preston Amerman, Director Employment and Personnel Research
Dow Chemical Company	D. H. Morgan, Director College Relations
du Pont de Nemours & Company, Inc., E. I.	R. A. Emerson, Manager Educational Liaison
Ealing Corporation	T. Walley Williams III, Manager Educational Equipment
Eastman Kodak Company	G. C. Durkin, Director Business and Technical Personnel
Electro Circuits, Inc.	T. M. Navoy President
Electronic Associates, Inc.	P. E. Huber, Product Manager Computers
Eli Lilly and Company	R. G. Weldele, Director Staff Engineering
Environmental Science Services Administration	P. F. Murphy, Chief Career Development Branch
Esso Production Research Company	W. B. Everett, Jr., Administrator Professional Recruitment
Esso Research and Engineering Company	Fred Senkowsky, Jr., Manager Employee Relations
Ethyl Corporation	T. J. Carron, Manager Employee Relations
Ex-Cell-O Corporation	C. Edward Schumacher, Director Education and Training
F. M. C. Corporation	C. B. Richards, Director Industrial Relations
Falk Corporation	E. J. Wellauer, Director Research and Development
Feedback Incorporated	M. J. Lawson Vice President
Firestone Tire & Rubber Company	S. T. Wepsic, Chief Engineer

Organization	Representative
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Ford Motor Company	L. J. Goebel, Supervisor College Relations & Recruiting Section
General Dynamics Corporation-Ft. Worth Division	E. J. Horton, Jr., Group Supervisor Engineering Administrative
General Electric Company	D. E. Irwin, Acting Manager Engineering Recruiting Service
General Foods Corporation-Technical Center	Richard Van Fleet, Manager Personnel Administration
General Mills, Inc.	J. W. Haun, Vice President & Director Engineering
General Motors Corporation-Styling Staff	Peter Kyropoulos, Director Technical
General Motors Corporation	P. J. Bryant, Manager Educational Relations
General Precision Systems, Inc.	Leil Tanenholz, Manager Training
General Radio Company	I. G. Easton, Senior Vice President
Gillette Safety Razor Company	W. S. Gale, Director R & D Toiletries Products
Goodrich Company, B. F.	R. P. Stock, Manager Akron Technical Services
Goodyear Tire and Rubber Company	David Thomas, Manager Salaried Personnel
Grumman Aircraft Engineering Corporation	A. W. Gilmore, Director Training and Development
Gulf Research & Development Company	J. H. Ferrick, Director Administrative Services Department
Gulf States Paper Corporation	W. R. Tucker, Manufacturing Manager Tuscaloosa
Gulf States Utilities Company	R. W. Sherwood Vice President
Halcon International, Inc.	David Brown, Senior Vice President

Organization	Representative
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Hewlett-Packard Company	N. O. Williams, Manager Professional Employment
Holt, Rinehart and Winston, Inc.	Richard Mates, Editor Engineering and Technology
Honeywell, Inc.	H. T. Eckstrom, Corporate Manager College Relations
Hughes Aircraft Company	J. C. Cox, Manager Corporate Personnel Administration
Hughes Tool Company	B. J. Whitworth, Manager General Engineering Services
Humble Oil & Refining Company	H. G. Taylor, Coordinator Professional Recruitment
Hydronautics, Incorporated	Phillip Eisenberg President
Illinois Bell Telephone Company	F. A. Luecker, Supervisor General Engineering Personnel
Illinois Central Railroad Company	A. L. Sams, Vice President & Chief Engineer
Illinois Power Company	G. P. Wilson, Manager Electrical Engineering
Industrial Publishing Co.	Paul Rolnick Vice President
Inland Steel Company	H. L. Taylor, Manager Associate
International Business Machines Corporation	D. L. Thomsen, Jr., Director Engineering Education
International Harvester Company	E. R. Allen, General Supervisor Personnel Development and Training
International Nickel Co., Inc.	F. E. Allen, Administrator Educational Programs and Services

Organization	Representative
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Iowa-Illinois Gas and Electric Company	R. B. Miller, Department Electric Engineering
Johnson and Johnson, Inc.	C. F. Hazelbauer, Manager Administrative Projects Community Relations
Jones and Laughlin Steel Corporation	J. A. Hill, Personnel Administrator Research and Development Department
Kaiser Engineers	F. B. Tobias Vice President
Kelsey-Hayes Company	S. F. Watanabe, Manager Produce Research
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Keuffel & Esser Company	M. G. Thomas, Manager Educational Marketing
Koppers Company, Inc.	C. Philip Kable, Manager Selection and Placement
Laboratory Sciences, Inc.	Fredric Flader President
Leeds & Northrup Company	W. R. Clark, Assistant Vice President Technical Affairs
Ling-Temco-Vought Aerospace Corp.	R. A. Peterson, Manager Training
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Litton Industries, Inc.	Julia Sharpe
Lockheed Aircraft Corporation	Ronald Smelt, Vice President & Chief Scientist
Lockheed Missiles and Space Company	D. D. Brewer, Coordinator Professional/Technical Training
Maytag Company	R. R. Braun, Manager Employment and Staffing
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Organization	Representative
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Michigan Bell Telephone Company	A. R. Meacham, Jr., Supervisor General Engineering Personnel
Minnesota Mining and Manufacturing Company	B. C. Baker, Manager Employment
Mitre Corporation	Christian Westphalen, Manager Personnel Development and Training
Mobil Oil Corporation	R. W. Brocksbank, Manager Recruiting
Monsanto Company	C. E. Johnson, Manager University Relations & Professional Recruitment
Mountain States Telephone Company	H. J. Strelesky, General Personnel Manager-Engineering
NASA Manned Spacecraft Center	R. R. Gilruth Director
National Cash Register Company	C. F. Rench, Vice President Product Engineering
National Starch and Chemical Corporation	Tom Lotito, Assistant Personnel
New England Telephone and Telegraph Co.	R. E. L. West, Engineering Supervisor Training
New Jersey Bell Telephone Company	V. J. Cinquina, Engineer General Staff
New Orleans Public Service, Inc.	L. J. Cucullu, Vice President & Chief Engineer
New York Telephone Company	H. H. Rhodes, Supervisor College Employment
Newark Electronics Corporation	F. J. McAllister, Vice President Industrial Sales
Niagara Mohawk Power Corporation	T. J. Brosnan, Vice President & Chief Engineer
North American Aviation, Inc.	F. G. Rizzardi, Manager Professional & Technical Development

Organization	Representative
Northrop Norair	C. W. Eyres, Assistant to Vice President-Engineering
Northwestern Bell Telephone Co.	L. W. Blumer, Engineer General Planning
Norton Company	B. S. Lardner, Supervisor College Recruitment
Ogden Technology Laboratories, Inc.	John Gear, Director Educational Equipment Division
Ohio Bell Telephone Company	W. F. Lacy, Supervisor General Personnel
Oklahoma Gas and Electric Company	R. E. Thornton, Manager Engineering
Olin Mathieson Chemical Corporation	M. H. Jacoby, Officer College Relations
Pacific Telephone and Telegraph Company	W. Woods, Assistant Vice President Personnel
Pan American Petroleum Corporation	George Roberts, Jr.
Pan American World Airways, Inc.	C. L. Carroll, Jr., Manager Technical Staff
Pennsylvania Power & Light Company	M. D. Farr, Director Personnel Administration
Peoples Gas Light & Coke Company	R. P. Lynch, Chief Engineer
Philadelphia Electric Company	W. J. Martin, Director Employment
Phillips Petroleum Company	J. P. Jones, Director Recruitment and Placement Division
Pitney Bowes, Inc.	E. J. Havey, Jr., Administrative Assistant to Engineering Vice Pres.
Pittsburgh Plate Glass Company	H. E. Kohlhammer, Manager College Relations
Polaroid Corporation	R. G. Flinchbaugh, Director Engineering Consultant Services
Pollak and Skan, Inc.	L. N. Skan President

Organization	Representative
Post Company, Frederick	W. M. Utley, Manager Merchandising
Proctor & Gamble Company	J. W. Plattner, Associate Director Industrial Relations Division
Public Service Electric and Gas Company	M. D. Hooven Consulting Engineer
Radio Corporation of America	H. E. Roush, Director College Relations
Raytheon Company	Dr. John Blair, Director Research and Scientific Liaison
Republic Steel Corporation	J. R. Wall, Director Personnel
Reynolds Metals Company	E. K. Bennett, Manager College Recruitment
Reynolds Tobacco Company, R. J.	N. T. Buddine, Chief Engineer
Rohm and Haas Company	J. C. Haas, Executive Vice President
Ronald Press Company	Eugene Simonoff Vice President
Sanders Associates, Inc.	J. E. Duras, Supervisor Personnel Development
Scott-Engineering Sciences Corp.	P. C. Zanetti President
Scott Paper Company	J. J. Collings, Administrator Technical Training
Shell Oil Company	W. B. Bryant, Manager Recruitment Division
Simulators, Inc.	C. J. McVey President
Solar, A Division of International Harvester Co.	Louis Klein, Manager Personnel Administration
South Carolina Electric and Gas Company	A. C. Mustard, Senior Vice President
Southern Bell Telephone & Telegraph Company	I. W. Carmack, Manager General Employment

Organization	Representative
Southern California Edison Company	R. H. Adams, Director Training
Southern New England Telephone Company	K. R. Hill, Supervisor General Engineering
Southwestern Bell Telephone Company	R. M. Whitton, Jr., Director College Relations
Standard Oil Company of California	R. C. Andresen, Engineer Assistant Chief
Sun Oil Company	R. A. Matteson, Director College Relations
Sundstrand Corporation	Duane Rohlfing, Manager Professional Employment & College Relations
Sylvania Electric Products, Inc.	Harris Reinhardt, Manager Employment
TRW Systems	W. D. McIvers, Supervisor College Relations
Tatung Engineering Company	T. S. Lin President
Teletype Corporation	D. G. DeJonge, Chief Personnel Utilization and College Relations Department
Texaco, Inc.	E. L. Taylor, Manager Personnel Research & College Relations
Timken Roller Bearing Company	I. E. Schiefer, Manager College Relations
Torrington Company	R. G. O'Connell, Director Marketing
Union Carbide Corporation	C. J. Metz, Manager College Relations
United Electronics Laboratories, Inc.	O. S. Hammer Vice President
U. S. Army Corps of Engineers	LTC R. M. Peach
U. S. Army Electronics Command	Dr. H. S. Bennett
United States Gypsum Company	C. E. Sahlen, Manager Employment

Organization	Representative
U. S. Public Health Service	A. H. Stevenson, Chief Engineer
United States Steel Corporation	R. A. Holan, Assistant to Administrative Vice President-Engineering
Universal Oil Products Company	D. B. Carson, Director Engineering
Upjohn Company	B. S. Lane, Director Engineering
Vickers Incorporated, Division of Sperry Rand Corporation	J. B. Slack, Manager Plant
Warwick Electronics, Inc.	E. E. Wells, Manager Training & Management Development
Western Electric Company, Inc.	E. K. Gill, Manager, College Relations & Corporate Education Center Planning
Westinghouse Air Brake Company	J. E. Stark, Vice President Industrial Relations
Westinghouse Electric Corporation	G. D. Lobingier, Director Graduate Education Department
Whitman, Requardt and Associates	R. C. Regnier. Partner
Wisconsin Motor Corporation	F. B. Esty, Vice President Engineer
Wisconsin Power and Light Company	J. Don Howard President
Wisconsin Telephone Company	H. F. Loeffler, Chief Engineer
Xerox Corporation	R. M. Jackson, Manager Personnel Relations
Zenith Radio Corporation	N. W. Aram, Vice President and Chief Engineer

OKLAHOMA STATE UNIVERSITY · STILLWATER

College of Engineering, Office of the Dean **74074**
Frontier 2-6211, Ext. 7551

February 19, 1968

Mr. George Parmakian
Chief Mechanical Engineer
Riley Stoker Corporation
Worcester, Massachusetts 01601

Dear Mr. Parmakian:

Several months ago you received a letter from Mr. Kenneth F. Jacobs, Technology Utilization Office--NASA, describing the educational Monographs being prepared under a NASA supported program at Oklahoma State University. You reported that the subject material would be of interest to practicing engineers.

We have initiated a follow on program to try to evaluate the effectiveness of Monographs in industrial seminars and individual study by engineers. We hope that you are interested in participating.

This program at Oklahoma State University involves selecting, editing and disseminating engineering and scientific education subject matter. The initial objective of the program was to develop supplementary text material for university classrooms. However, we believe it has potential use by industry. You, of course, supported this idea in your original review of the Monographs.

Monographs are being prepared by experienced writers and teachers in three subject areas: Control Systems, Heat Transfer and Thermodynamics. They are designed for one to three hours of instruction.

Abstracts of 16 Monographs are enclosed for your review and distribution to interested people in your organization. Monographs can be furnished to individuals or organizations who will evaluate them as an educational tool. An evaluation sheet is provided with each Monograph; the completion of the evaluation sheet would be of considerable benefit to the future planning of the program.

A copy of one of the recent Monographs is enclosed for your review. Additional Monographs can be obtained by sending me the following information: Monograph number, name and mailing address of the person(s) who will use it, number of copies and approximate date desired for use.

We believe the use of Monographs has a great potential in the continuing education of practicing engineers.

Sincerely,

Robert L. Overton

Robert L. Overton
Deputy Administrator
NASA Pilot Program

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Enclosure